WHAT IS CLAIMED IS:

1. For use with a liquid chromatography setup that includes a chromatographic column through which a mobile phase having at least one component passes as eluent for analysis by a post-column detector, a system to increase elution time of chromatographic peaks associated with said detector, the system including:

(a) a micro switching valve unit having an input port in fluid communication with said eluent, said micro switching valve unit being switchable between a first position in which said eluent flows at a first flow rate to said post-column detector, and a second position in which eluent flow through said column is halted and in which a portion of said eluent within a region of said micro switching valve unit flows at a second flow rate to said post-column detector, said second flow rate being substantially slower than said first flow rate;

(b) a secondary pump system, coupleable to a portion of said micro switching valve unit, and operable to contribute to said second flow rate when said micro switching valve unit is in said second position;

wherein when said micro switching valve unit is in said second position, said secondary pump system pumps a portion of said eluent retained in a portion of said micro switching valve unit to said post-column detector such that individual detection peaks are input more slowly to said post-column detector.

2. The system of claim 1, further including a control unit coupled to said post-column detector, said control unit outputting a signal causing said micro switching valve unit to switch from said first position to said second position when a detection peak is sensed by said post-column detector, and causing said micro switching valve unit to return to said first position from said second position when a said detection peak ends;

said control unit further coupled to said secondary pump to control flow rate thereof as a function of whether said micro switching valve unit is in said first position or is in said second position.

3. The system of claim 2, wherein:

said setup include a primary pre-column pump; and

said control unit causes said primary pre-column pump to produce a slower flow rate when said micro switching valve unit is in said second position.

4. The system of claim 1, wherein:
said secondary pump system includes a syringe pump; and
said second flow rate is about 10% to about 50% of said first flow rate.

5. The system of claim 1, wherein said liquid chromatography setup is selected from a group consisting of (a) a capillary liquid chromatography setup, and (b) a nano liquid chromatography setup.

6. The system of claim 1, wherein when said micro-valve unit is in said second position, said micro-valve unit and said secondary pump system contribute to a substantially constant pressure in said column.

7. The system of claim 1, wherein said micro-valve unit has an internal volume less than about 5 µl, wherein dead volume for said system is reduced.

8. The system of claim 1, wherein:
said first flow rate has a value in a range of about 50 nl/minute to about 400 nl/minute; and
said second flow rate has a value in a range of about 5 nl/minute to about 50 nl/minute.

9. The system of claim 1, wherein said post-column detector includes at least one of (a) a mass spectrometer, and (b) a nuclear resonance detector.

10. The system of claim 1, wherein said set-up includes pre-column flow splitting enabling delivery of microflow over said column and enabling delivery of nanoflow over said column.

11. The system of claim 1, wherein when said micro-valve unit is in said second position, gradient composition is maintained substantially constant, and when said micro-valve unit is in said first position, said gradient composition is maintained.

12. The system of claim 1, wherein:
in said second position said micro-valve unit halts chromatographic process by blocking outflow from said column;

and inlet flow rate to said column is reduced by about 50% to about 80% using a pre-column split.

13. For use with a liquid chromatography setup having a chromatographic column through which a mobile phase passes as eluent for analysis by a post-column detector, a system to increase elution time of chromatographic peaks associated with said detector, the system including:

means for selectively passing eluent flow from said column to said post-column detector in a normal but, and for halting eluent flow from said column in a peak parking mode during which a portion of eluent is fluid coupled to said post-column detector;

means for substantially reducing flow rate during said peak parking mode relative to flow rate during said normal mode; and

means, coupled to said post-column detector, for selecting whether said system shall operate in said normal mode or in said peak parking mode.

14. The system of claim 13, wherein said means for selectively halting includes a micro switching valve unit having a plurality of two-way valves and a plurality of ports between adjacent ones of said two-way valves.

15. The system of claim 13, wherein said means for producing a substantially reduced flow rate includes a micro syringe pump that in peak parking mode produces a flow rate of about 10% to about 50% of a flow rate present during said normal mode.

16. The system of claim 13, wherein at least one of said means for selectively halting and said means for producing contribute to a substantially constant pressure over said column during said peak parking mode.

17. The system of claim 13, wherein at least one of said means for selectively halting and said means for producing contribute to a substantially constant gradient composition during said peak parking mode.

18. A method for use with a liquid chromatography setup having a chromatographic column through which a mobile phase passes as eluent for analysis by a post-column detector to increase elution time of chromatographic

peaks associated with said detector, the method including the following steps:

(a) selectively passing eluent flow from said column to said post-column detector in normal mode, and halting eluent flow from said column in a peak parking mode;

(b) fluid coupling a portion of said eluent to said post-column detector in said peak parking mode;

(c) producing a substantially reduced flow rate of delivery of said eluent to said post-column detector during said peak parking mode; and

(d) operating said system in peak parking mode when a peak is detected by said post-column detector, and operating said system in normal mode otherwise.

19. The method of claim 18, wherein step (c) results in a flow rate during peak parking mode of about 10% to about 50% of a flow rate present during said normal mode.

20. The method of claim 18, further maintaining a substantially constant pressure over said column during said peak parking mode.